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Chapter 3
Prevalence and Mortality

Preface

In any population, the prevalence of smoking and the demonstrable health effects of tobacco consumption are out of phase. For some diseases, such as lung cancer, the lag may be 20 years or more; for heart disease or adverse outcomes of pregnancy, the lag may be considerably shorter. But the overall burden of disease reflects the cumulative long-term impact of tobacco use, or "maturity" of the smoking epidemic. This relationship between prevalence of smoking and smoking-related disease has been examined in detail for North America and will not be reiterated here. Rather, the focus is on the countries of the Americas in which tobacco use is an emerging problem.

This discussion juxtaposes estimates of the current prevalence of smoking in Latin America and the Caribbean with estimates of smoking-attributable mortality. Both estimates attempt to define the dimensions of the current and future health threat posed by tobacco use in the region.

Prevalence of Smoking in Latin America and the Caribbean

Introduction

The expansion of transnational corporations into international markets (described in Chapter 2) began in the early 1950s, accelerated in the 1960s, and was characterized by denationalization of local tobacco industries and development of consumer preference for the products of these corporations. In Latin America and the Caribbean, these events occurred along with complex social and demographic changes—often characterized as a demographic transition (Omran 1971; Jamison and Mosley 1991)—that made the area an attractive market for tobacco. These changes were not uniform throughout the region nor even, in some instances, uniform within a single country.

Nonetheless, four main sociodemographic factors have contributed to the potential of the population in Latin America and the Caribbean to initiate cigarette smoking. These factors are growth of groups likely to smoke, dissemination of an urban lifestyle, greater access to education, and the entry of women into the labor force. These factors are summarized below and related to available data on the prevalence of smoking.

Demographic Characteristics

Population Configuration

The population size and growth rate in Latin America and the Caribbean have been affected primarily by changes in the birthrate and death rate; with some regional exceptions, migration and emigration have been less important. Changes in fertility, natality, and mortality have been dramatic (Table 1).

In 1930, overall mortality was high in Latin America, and life expectancy was only 35 years, although in several countries, such as Argentina, Uruguay, and Cuba, life expectancy was greater because an export-driven economy (Merrick 1986) had encouraged environmental and sanitary improvements. Most Latin American countries, however, did not introduce widespread methods for control of endemic diseases until after World War II. Between 1950 and 1970, improved methods for the control of major infectious diseases of children and adults may have accounted for 30 percent of the increase in life expectancy (Palloni 1981). By the 1960s, life expectancy at birth for citizens of most Latin American and Caribbean

Table 1. Demographic indicators, Latin America and the Caribbean,* 1950–1990

Indicator	1950–55†	1955–60	1960–65	1965–70	1970–75	1975–80	1980–85	1985–90
Annual growth rate (%)‡	2.73	2.75	2.79	2.60	2.48	2.29	2.17	2.06
Crude birthrate§	42.5	41.7	41.1	38.0	35.4	32.4	30.6	28.7
Crude mortality rate‖	15.4	13.6	12.1	10.9	9.7	8.6	7.9	7.4
Total fertility rate¶	5.87	5.90	5.96	5.53	4.99	4.36	3.93	3.55
Life expectancy at birth**	51.9	54.8	57.3	59.2	61.3	63.3	65.2	66.7
Infant mortality rate††	126	112	100	91	81	70	61	54

Source: United Nations (1991).
*Excludes Belize and Puerto Rico.
†From July of the first year to July of the last year in each period.
‡Total increase in population during one year divided by mean population for the same period.
§Number of births during one year divided by mean population for the same period; per 1,000 persons.
‖Number of deaths during one year divided by mean population for the same period; per 1,000 persons.
¶Average number of children that would be born during the fertile period of each woman in a hypothetical cohort (in accordance with the fertility rate by age for the cohort) who was not at risk for mortality before the end of the fertile period.
**Average number of years that would be lived by a newborn in a hypothetical cohort subject to the mortality schedule in effect at the time.
††Number of deaths per year among children under one year of age divided by number of births during the same period; per 1,000 persons.

Table 2. Estimated population,* Latin America, the Caribbean, and the United States, 1950–1990

Region	1950	1960	1970	1980	1990
Latin America and the Caribbean					
Total	165.9	218.1	285.7	362.7	449.9
≥15 years of age	98.5 (59.4)†	125.4 (57.5)	164.3 (57.5)	220.2 (60.7)	287.5 (63.9)
United States					
Total	152.3	180.7	205.1	227.8	251.3
≥15 years of age	111.3 (73.1)	124.5 (68.9)	147.0 (71.7)	176.5 (77.5)	197.0 (78.4)

Source: United Nations (1991).
*In millions.
†Percentage of total population ≥15 years is given in parentheses.

countries was about 60 years. But since advances were not uniform, less industrially developed countries, such as Bolivia, Haiti, and the Central American countries (except for Costa Rica), reported a life expectancy at birth of less than 50 years. Nonetheless, for the region as a whole, overall crude mortality and infant mortality have declined by over 50 percent since 1950 (Table 1).

Through the first half of the twentieth century, the birthrate increased in Latin America, except for the urban populations of some countries (such as Argentina and Uruguay) that experienced early economic improvements. After 1965, the birthrate in larger countries, such as Brazil, Mexico, and Colombia, began to decrease, and the region as a whole experienced declining fertility. Total fertility has diminished by 40 percent since 1960 (Table 1).

As a result of these changes, the population growth rate for Latin America and the Caribbean increased between 1900 and 1940, peaked just after World War II, and leveled off at 2.8 percent per year from 1945 to 1965. Since then, the rate of growth has slowed; it is estimated at 2.1 percent from 1985 to 1990 (Table 1). In 1950, the total population of the region was only slightly greater than that of the United States, but by 1990, it was 1.8 times greater (Table 2). Although the proportion of the population in Latin America and the Caribbean under 15 years of age has remained high (from 41 percent in 1950 to 36 percent in 1990) compared with that of the United States (from 27 percent to 22 percent), the number of persons aged 15 or over (the main tobacco users) in Latin America and the Caribbean increased dramatically over that in the United States. In 1950, the population aged 15 or over in Latin America and the Caribbean was 13 percent smaller than that in the United States; in 1990, it was 32 percent larger.

These population shifts have created a large potential market of tobacco consumers in Latin America. Further, the trend in the birthrate ensures that a substantial number of young people will continue to enter the market for some time to come.

Urbanization

Although immigration and emigration have had local effects, they have not had a large effect on the demographic composition of the Latin American region as a whole. However, internal migration has. Large-scale internal migration began in Latin America in the 1930s; by the 1950s, approximately one-third of the population of the region resided in urban areas, and by 1980, two-thirds of the total population was urban (Table 3).[1] In countries where economic growth began early (Argentina, Brazil, Chile, Colombia, Cuba, Mexico, Uruguay, and Venezuela), approximately 70 percent of the population is concentrated in urban areas, but Haiti, Bolivia, and several Central American countries, such as Honduras, Guatemala, and El Salvador, remain primarily rural.

The urban lifestyle—which includes social differentiation, division of labor, greater availability of community services, and greater access to popular goods—has generally characterized Latin American life in the last several decades. Nationwide television networks and an upgraded network of roads link regions and consolidate markets for goods, services, and labor nationwide (Wilkie 1984). Features of urban life are now more available in rural areas as well.

[1] The definition of an urban area differs from country to country. When a uniform definition is used—population centers with more than 20,000 inhabitants—the proportion is considerably smaller, although the trend remains the same.

Table 3. Percentage of population living in urban centers, by country in Latin America,* 1950–1980

Country	Census definition of urban area†				20,000 or more inhabitants		
	1950	1960	1970	1980	1960	1970	1980
Argentina	62	74	78	83	59	66	70
Bolivia	35	24	38	45	23	27	34
Brazil	36	46	56	67	27	36	46
Chile	60	68	75	81	51	61	68
Colombia	39	53	57	64	34	44	54
Costa Rica	33	35	39	43	19	26	30
Cuba	51	55	60	68	39	43	48
Dominican Republic	24	30	39	50	19	30	41
Ecuador	28	36	40	47	27	33	40
El Salvador	36	39	39	43	18	21	25
Guatemala	25	34	34	37	15	16	19
Haiti	12	15	20	24	10	13	17
Honduras	18	23	28	35	11	18	24
Mexico	43	51	59	66	29	35	43
Nicaragua	35	41	47	51	20	31	37
Panama	36	42	47	50	33	39	41
Paraguay	35	36	37	42	22	27	32
Peru	41	47	58	64	27	39	47
Uruguay	57	72	82	85	60	63	66
Venezuela	35	63	72	79	47	59	67
Total	37	44	58	65	32	40	47

Source: Wilkie and Ochoa (1989); Centro Latinoamericano de Demografía (1990).
*Excludes Belize and Puerto Rico.
†Differs by country.

The trend toward urbanization in Latin America has concentrated and consolidated the market for tobacco products, as it has for most other consumer items. The techniques of demand creation (described in Chapter 2) largely depend on an easily reachable mass audience—an audience which in Latin America has demonstrated persistent relative and absolute growth.

Educational Opportunities

As a by-product of urbanization, access to education in Latin America has increased substantially in recent decades. Only 58 percent of the total population aged 6 to 11 years was enrolled in primary schools in 1960 (Table 4). By 1987, this enrollment had increased to 86 percent. Since 1970, enrollment in secondary

Table 4. Percentage of population in Latin America and the Caribbean enrolled in school, by age group and sex, 1960–1987

Year	6–11 years			12–17 years			18–23 years			6–23 years		
	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females
1960	57.7	58.1	57.4	36.3	38.7	33.9	5.7	7.1	4.3	36.9	38.2	35.5
1970	71.0	70.7	71.3	49.8	52.1	47.5	11.6	13.6	9.7	48.3	49.5	47.1
1975	76.3	76.4	76.1	58.0	59.8	56.1	18.9	21.0	16.8	54.3	55.6	52.9
1980	82.4	82.8	81.9	62.6	63.6	61.6	23.6	25.1	22.0	58.8	59.8	57.7
1985	85.2	85.8	84.7	66.2	67.3	65.1	23.8	24.8	22.8	60.4	61.2	59.4
1986	85.9	86.6	85.3	66.7	67.8	65.6	24.2	24.9	23.5	60.8	61.7	60.0
1987	86.3	86.9	85.7	68.2	69.2	67.2	25.1	25.8	24.4	61.8	62.6	60.9

Source: United Nations Educational, Scientific, and Cultural Organization (1989).

schools has also increased significantly, and the number of university students has dramatically increased as well—from 500,000 in 1960 to 6 million in 1990 (Brunner 1990). Women continue to have somewhat less access to education than do men, but since 1960, gains in enrollment have been equivalent for both sexes (Table 4).

The gains in education have brought a more literate and more discriminating group of consumers to the marketplace. The net effect may be complex—although sophisticated consumers may be more exposed to tobacco marketing techniques and are more likely to have disposable income for tobacco products, they may also have better knowledge of the adverse health effects of tobacco use. Data on smoking prevalence and educational status are ambiguous (see "Prevalence Estimates" later in this chapter).

Income Distribution and the Labor Force

In Latin America between 1950 and 1980, the agricultural sector of the labor force declined, but both the trade sector and the manufacturing sector increased (4.5 percent and 3.3 percent per year, respectively) (Economic Commission for Latin America and the Caribbean [ECLAC] 1989). In urban areas, more than one-third of the total labor force is employed in these two sectors. A study of occupational stratification in six countries found a large increase in nonmanual employment (De Oliveira and Roberts 1989). But despite an apparent increase in the size of the middle class in Latin America, the unevenness of income distribution still exceeds that of the United States (Table 5). In 1975, high-income groups in Latin America accounted for a larger percentage of total income than did the corresponding groups in the United States. Conversely, the lowest income group accounted for a much smaller percentage of total income in Latin America than in the United States (7.7 vs. 17.2 percent, respectively). Perhaps more important, however, the average income of the lowest income group in Latin America was one-tenth that of the lowest income group in the United States. These income disparities have persisted into the mid-1980s. For selected Latin American and Caribbean countries for which data are available (Table 6), the concentration of income in the upper 20 percent of households is substantially greater than for North America.

A critical socioeconomic factor has been the increasing entry of women into the labor force. Among developing nations worldwide during the 1960s, the highest percentage of female nonagricultural wage earners was found in Latin America (Anker and Hein 1987). Between 1970 and 1980, the size of the female labor force increased at twice the rate of that of the male labor force (5.1 vs. 2.5 percent, respectively) (ECLAC 1989).

The main sociodemographic effect of changes in the labor force has been the creation of a group of middle-income wage earners with increased disposable income, a group in which women figure prominently. Such a consumer group is of interest to the tobacco industry because it may serve as a focus for creation of demand for tobacco (Ernster 1983).

Table 5. Income distribution in Latin America* and the United States, 1960 and 1975

	Percentage of total income		Annual income per family†	
Income bracket	**1960**	**1975**	**1960**	**1975**
Latin America				
10% richest	46.6	47.3	11,142	15,829
20% below the richest 10%	26.1	26.9	3,110	4,497
30% below the richest 10%	35.4	36.0	2,542	3,636
60% poorest	18.0	16.7	833	1,095
40% poorest	8.7	7.7	520	648
United States				
10% richest	28.6	28.3	15,538	21,488
20% below the richest 10%	26.7	26.9	13,490	17,807
30% below the richest 10%	36.7	36.9	11,577	15,891
60% poorest	34.8	34.8	6,099	8,276
40% poorest	17.0	17.2	4,976	6,635

Source: Portes (1984).
*Excludes Belize, Cuba, and Puerto Rico.
†In 1970 U.S. dollars.

Table 6. Income distribution in selected countries of the Americas

Country	Year	Percentage of household income (by percentile group)					
		Lowest quintile	Second quintile	Third quintile	Fourth quintile	Highest quintile	Highest 10%
Brazil	1983	2.4	5.7	10.7	22.8	62.6	46.2
Canada	1987	5.7	11.8	17.7	24.6	40.2	24.1
Colombia	1988*	4.0	8.7	13.5	20.8	53.0	37.1
Costa Rica	1986*	3.3	8.3	13.2	20.7	54.5	38.8
Jamaica	1988†	5.4	9.9	14.4	21.2	49.2	33.4
Peru	1985–1986†	4.4	8.5	13.7	21.5	51.9	35.8
United States	1985	4.7	11.0	17.4	25.0	41.9	25.0
Venezuela	1987*	4.7	9.2	14.0	21.5	50.6	34.2

Source: The World Bank (1991).
*Based on per capita income.
†Based on per capita expenditure.

The four main factors discussed here have all affected prevalence of smoking in Latin America, which is summarized below. The economic significance of these sociodemographic changes is discussed further in Chapter 4 (see "Economics of the Tobacco Industry").

Prevalence Estimates

Systematic surveillance of smoking prevalence has generally not been conducted for most regions of Latin America. Consistent time series and uniform methods of data collection are just now being developed (see Chapter 6). Available information on prevalence is primarily derived from the following sources: an eight-city survey conducted by the Pan American Health Organization (PAHO) in 1971 (Joly 1977); a set of surveys conducted by the Gallup Organization for the American Cancer Society in 1988 (Gallup Organization 1988); and a set of reproductive health surveys conducted by local public sector or private sector agencies, principally sponsored by the U.S. Agency for International Development, with technical assistance provided by the Centers for Disease Control (CDC). Prevalence data from additional surveys (Tables 16–19) have been compiled by PAHO and are available in a companion document to this report (PAHO 1992). Very few of the almost 150 surveys compiled have been formally published, and they differ widely by sampling strategy, target population, method of weighting and adjustment, and reporting format. Definitions of various categories of smokers also differ across studies (e.g., heavy vs. light,

Table 7. Prevalence of cigarette smoking (%) among persons aged 15–74 in eight cities* in Latin America, adjusted for age and sex,† 1971

City	Total		Men		Women	
	Current smoker	Former smoker	Current smoker	Former smoker	Current smoker	Former smoker
La Plata, Argentina	40	8	58	13	26	5
São Paulo, Brazil	37	4	54	10	26	3
Bogotá, Colombia	36	7	52	7	24	3
Caracas, Venezuela	36	8	49	5	21	2
Santiago, Chile	35	5	47	10	20	4
Mexico City, Mexico	30	5	45	8	17	3
Guatemala City, Guatemala	22	6	36	11	10	9
Lima, Peru	21	4	34	7	7	1

Source: Joly (1977).
*In order of prevalence of current smokers.
†Adjusted by the direct method, based on the age distribution of respondents.

regular vs. occasional, and current vs. former). Most surveys provide crude prevalence for the group examined (number of smokers divided by number of persons surveyed), and some surveys report results by age, sex, ethnic group, residence, and occupation. Comparison of prevalence by country or by group within countries is problematic, and the only summary statistics are ranges, distributions, and medians.

Prevalence Reported by the Pan American Health Organization

The 1971 PAHO survey reported prevalence of cigarette smoking for persons in eight major cities of Latin America (Table 7). Estimates were age-adjusted by using the combined total population of the eight cities as the standard. The age-adjusted prevalence of smoking ranged from 21 to 40 percent. For men, it ranged from 34 to 58 percent (median = 48 percent), and for women, from 7 to 26 percent (median = 21 percent). The prevalence for U.S. males and females at the time was 44 percent and 30 percent, respectively; however, the figures are not directly comparable to those of the PAHO survey because of methodologic differences (U.S. Department of Health and Human Services [USDHHS] 1989).

Most smokers (98 percent) reported that they smoked cigarettes rather than cigars or pipes (Joly 1977), and most of them (71 percent of men and 79

Table 8. Standardized ratio* of cigarette smoking among persons aged 15–74 in eight cities of Latin America, by sex and level of education, 1971

	Men				Women			
City	No schooling	Primary school	Secondary school	Post-secondary school	No schooling	Primary school	Secondary school	Post-secondary school
Bogotá, Colombia								
Current smoker	0.9	1.0	1.0	1.0	0.7	0.8	1.2	2.0
Former smoker	0.8	1.2	0.8	1.0	1.4	1.2	0.9	2.0
Caracas, Venezuela								
Current smoker	1.1	1.1	0.9	0.9	1.4	1.1	0.9	1.1
Former smoker	—	0.8	1.1	1.8	1.4	0.7	1.1	1.0
Guatemala City, Guatemala								
Current smoker	1.6	0.9	0.9	1.1	0.6	0.7	1.7	2.3
Former smoker	1.1	0.9	1.1	1.0	1.1	0.8	0.8	1.8
La Plata, Argentina								
Current smoker	0.8	1.1	1.0	1.0	0.7	0.7	1.2	1.4
Former smoker	1.6	1.1	0.9	1.2	—	0.6	1.2	1.9
Lima, Peru								
Current smoker	1.6	0.8	1.0	1.4	0.5	0.6	1.4	2.1
Former smoker	—	1.3	0.8	0.7	—	1.1	1.2	1.1
Mexico City, Mexico								
Current smoker	1.4	1.1	1.0	1.1	0.7	0.8	1.0	1.6
Former smoker	—	1.1	0.9	1.5	1.4	1.1	0.8	0.7
Santiago, Chile								
Current smoker	0.9	0.8	1.1	1.1	0.7	0.8	1.1	1.5
Former smoker	0.2	1.1	1.1	1.2	0.6	0.8	1.1	2.5
São Paulo, Brazil								
Current smoker	0.8	1.0	1.1	0.9	1.2	1.1	0.9	2.0
Former smoker	1.5	1.0	0.6	1.3	1.3	0.9	0.5	0.9
All eight cities								
Current smoker	1.1	1.1	1.0	1.1	0.8	0.8	1.2	1.6
Former smoker	0.7	1.0	0.9	1.2	0.9	0.8	1.1	1.6

Source: Joly (1977).
*Each entry represents the age-adjusted rate for the subgroup divided by that for the total sample. Educational categories are assumed to have the same age distributions within each sex group.

Table 9. Prevalence of smoking (%) in 12 Latin American countries, 1988

Country	Total		Men		Women	
	Current smoker	Former smoker	Current smoker	Former smoker	Current smoker	Former smoker
Chile	39	14	41	17	31	11
Uruguay	32	16	44	25	23	9
Colombia	28	16	37	21	18	11
Costa Rica	28	16	35	23	20	10
Peru	22	12	28	19	17	6
Brazil	38	12	40	18	36	6
Ecuador	27	7	39	10	16	5
Mexico	27	10	37	13	17	6
Argentina	35	17	43	25	27	9
Honduras	24	15	36	19	11	12
El Salvador	25	8	38	10	12	5
Venezuela	27	15	32	21	23	11

Source: Gallup Organization (1988).

percent of women) preferred light-tobacco cigarettes (Joly 1977). The percentage of smokers who smoked light-tobacco cigarettes was greater among persons with at least a high school education—from 54 to 77 percent for men and from 58 to 89 percent for women. Preference for dark tobacco was much greater among older (55 to 74 years) than among younger (15 to 24 years) persons (40 vs. 14 percent).

Although all cities reported a lower prevalence of smoking for women than for men, the difference was less for areas in which overall consumption was higher. For example, in La Plata, Argentina, and Caracas, Venezuela, the prevalence of smoking for women was approximately half that for men. However, in Lima, Peru, the prevalence of smoking for women was one-fifth that for men. Furthermore, in almost all sample populations, the age-adjusted prevalence of cigarette smoking increased with educational level for women but not for men (Table 8). In most areas, the prevalence of smoking for women with postsecondary school education was about two times higher than that for women with no schooling—evidence that education may have served demand creation rather than hazard recognition. However, the incidence of quitting was also greater among better-educated women than among better-educated men; thus, several factors may have been operating simultaneously.

In 1971, the proportion of heavy smokers (defined as persons who smoke 20 or more cigarettes per day) was greater for men (29 percent) than for women (15 percent). In addition, more men than women began smoking before age 16 (33 percent and 23 percent of those who smoke, respectively). Imitation of friends and companions was the reason adolescents most often gave for starting to smoke.

Prevalence Reported by the Gallup Organization

The only other multicountry survey was conducted by the Gallup Organization in 12 countries in 1988 (Tables 9, 16–18). Unfortunately, the methods of the 1988 Gallup survey and the 1971 PAHO survey differed substantially. The sampling frame and methodology were not reported in detail for the Gallup survey, although some weighting scheme was used, and prevalence was not age-adjusted. Only seven countries were in both surveys. The 1971 PAHO survey focused exclusively on urban areas; the 1988 Gallup survey concentrated on urban areas but included rural areas as well. The accuracy and precision of the Gallup survey are difficult to judge, and direct comparisons with the PAHO survey may be misleading. For example, data from the Gallup survey suggest that the overall prevalence of smoking decreased in the seven countries included in both surveys (Tables 7 and 9), but results from other surveys (Tables 16–18) are not consistent with these findings.

Comparisons within each survey may be legitimate, although they must still be interpreted with caution. In the 1988 Gallup survey, the overall prevalence of smoking was higher in countries that underwent early modernization, such as Chile (39 percent), Brazil (38 percent), Argentina (35 percent), and Uruguay (32 percent). Overall prevalence was lower in

Table 10. Male-to-female ratio of smoking prevalence in seven Latin American countries, 1971 and 1988

Country	1971	1988
Argentina	2.4	1.6
Brazil	2.7	1.1
Chile	1.8	1.3
Colombia	2.5	2.1
Mexico	2.7	2.2
Peru	5.3	1.6
Venezuela	1.8	1.4

Source: Joly (1977); Gallup Organization (1988).

less economically developed countries, such as Peru (22 percent), Honduras (24 percent), and El Salvador (25 percent). In both surveys, a higher proportion of men than women were heavy smokers, although the definition of heavy smoking appears to differ between the two surveys. The difference in prevalence by sex has decreased substantially (Table 10). In several countries (particularly Brazil and Chile), almost as many women as men are smokers.

Prevalence Reported by Reproductive Health Surveys

Since the late 1970s, CDC, in collaboration with national investigators, has surveyed reproductive health practices of women in Latin America. Most of these household surveys have asked questions about smoking. Additional household surveys of young adults (men and women aged 15 to 24 years) have also asked about smoking practices. These surveys produced weighted prevalence estimates representative of the area studied. The overall results have not been age-adjusted, but age-specific results are directly comparable. These surveys are discussed together because of the general uniformity of the methods used; other surveys of women of reproductive age are discussed later in this section.

Among women of childbearing age, the prevalence of smoking in the late 1980s varied from 6 to 33 percent in the areas studied (Table 11). Again, because of differences in data collection, direct comparisons cannot be made with earlier work, but the data at least suggest that the prevalence of smoking among women in São Paulo, Brazil, may have increased—the prevalence for women aged 15 to 44 was somewhat higher in 1986 (31 percent) than that for women aged 15 to 74 in 1971 (26 percent), although lack of methodologic detail prevents formal testing. In contrast, the prevalence of smoking for women in Guatemala may have declined during that period.

Surveys of young adults, conducted in selected Latin American countries in the late 1980s (Table 12), suggest that the smoking initiation rate (also referred to as the rate of smoking uptake) is high in at least some areas. Uptake of smoking is higher in the more-developed countries, although probably in urban areas only. In several countries surveyed (Guatemala, Jamaica, and Costa Rica), prevalence of smoking among young women is low. The increased tendency to smoke among women in urbanized areas is also evident in Brazil (Table 12), where women in the more urbanized southern areas have almost twice the prevalence of smoking as do women in the northeast.

Results from the 1988 survey of young adults in Chile (Valenzuela, Herold, Morris 1989) illustrate some important patterns (Table 13). In this survey, over 1,600 men and women aged 15 to 24 were sampled, although the sample size varied for specific questions. In Santiago, 53 percent of the young men and

Table 11. Prevalence of smoking among women of reproductive age (15–44 years*), selected areas of the Americas, 1979–1989

Area	Year	Sample size	Prevalence (%)
Brazil†	1986	5,892	30.6
Rio de Janeiro	1986	749	33.0
São Paulo	1986	769	30.8
South	1986	846	32.2
Northeast	1986	1,792	29.6
Guatemala‡	1983	3,670	6.6
Guatemala§	1987	5,160	4.0
Costa Rica‖	1986	3,277	12.4
Jamaica¶	1989	6,112	6.2
Puerto Rico‡	1982	2,861	15.6
U.S.–Mexico Border**			
Whites (non-Hispanic)	1979	798	31.6
Mexican–Americans	1979	1,235	18.5

*Age group 15–49 years for women in Costa Rica and Jamaica.
†All values for Brazil are from Centers for Disease Control (CDC) (1986).
‡Anderson (1985).
§CDC (1987a).
‖Asociación Demográfica Costarricense and CDC (1987).
¶McFarlane and Warren (1989).
**Smith, Warren, Garcia-Nuñez (1983).

Table 12. Prevalence of smoking among persons aged 15–24, selected countries of the Americas, 1986–1990

Country and city	Year	Men		Women	
		Sample size	Prevalence (%)	Sample size	Prevalence (%)
Brazil*	1986	—	—	2,479	27.3
Salvador†	1987	871	13.9	956	14.1
São Paulo‡	1988	750	33.7	804	26.2
Curitiba§	1989	950	24.4	913	22.0
Rio de Janeiro§	1989	848	22.5	831	22.0
Recife§	1989	1,154	23.9	989	12.0
Chile (Santiago)‖	1988	800	53.3	865	41.0
Costa Rica¶	1990	1,405	23.7	1,582	5.4
Guatemala**	1987	—	—	2,204	2.5
Jamaica††	1989	—	—	2,605	2.6

*Centers for Disease Control (CDC) (1986).
†Sakamoto, Freire, Morris (1991).
‡Universidade Federal da Bahia and CDC (1989).
§CDC (1990a).
‖Valenzuela, Herold, Morris (1989).
¶CDC (1990b).
**CDC (1987a).
††National Family Planning Board and CDC (1988).

41 percent of the young women were current smokers, and prevalence of smoking increased with age. For younger people (in these data, persons 15 to 17 years old), the prevalence of smoking approximates the rate of smoking initiation. In Santiago, the initiation rate was 46 percent for men and 34 percent for women. By ages 22 to 24, more than half of both sexes were current smokers, and 22 percent of both sexes stated that they were former smokers. The vast majority of both men and women were light smokers: 78 percent of men and 89 percent of women smoked less than 10 cigarettes per day. The proportion of heavy smokers increased with age.

With regard to educational attainment and smoking, the 1988 results from Santiago are consistent with those of the PAHO survey of 1971. A greater percentage of educated women were smokers (46 percent of women with superior education and 42 percent

Table 13. Prevalence of smoking and quantity smoked among persons aged 15–24, Santiago, Chile, 1988

Group	Total	15–17	18–19	20–21	22–24
Women					
Current smoker	41.0	33.9	44.0	36.0	52.1
Former smoker	22.7	24.1	20.7	23.8	21.6
Less than one-half pack per day	88.5	93.0	89.4	83.1	86.5
One-half pack or more per day	11.3	6.0	10.6	17.0	13.5
Men					
Current smoker	53.3	46.0	60.1	55.2	56.2
Former smoker	22.3	25.4	19.0	20.8	21.9
Less than one-half pack per day	78.2	85.6	75.5	76.5	73.7
One-half pack or more per day	21.8	14.4	24.5	23.5	26.3

Source: Valenzuela, Herold, Morris (1989).

Table 14. Prevalence of smoking and quantity smoked among persons aged 15–24, by educational level and sex, Santiago, Chile, 1988

Group	Educational level			
	Basic* or less	Middle† (incomplete)	Middle (complete)	Superior‡
Women				
Current smoker	41.5	38.4	42.3	46.4
Former smoker	24.6	22.4	22.6	20.6
Less than one-half pack per day	90.1	91.8	92.4	66.7
One-half pack or more per day	9.9	7.5	7.6	33.3
Men				
Current smoker	56.7	55.0	52.3	46.5
Former smoker	23.6	22.4	22.7	19.3
Less than one-half pack per day	79.8	81.4	77.9	66.0
One-half pack or more per day	20.2	18.6	22.1	34.0

Source: Valenzuela, Herold, Morris (1989).
*1–8 years.
†9–12 years.
‡>12 years.

of women with basic education or less), but the reverse was true for men (47 percent vs. 57 percent for the corresponding educational levels) (Table 14). Women with greater educational attainment also tended to smoke more (one-third smoked more than 10 cigarettes per day). The prevalence of smoking as a function of the educational level of the father of the respondent followed the pattern for the educational level of the respondent.

History of pregnancy appeared to have little effect on the prevalence of smoking among women in Santiago (Table 15). On the contrary, prevalence of smoking was slightly higher for women who had been pregnant (43 percent) or who had given birth (47 percent) than for women who had never been pregnant or had never given birth (around 40 percent for both groups). Since the data are not age-adjusted, this difference may result from the generally lower age distribution of women who have never been pregnant. The data suggest that pregnancy has little influence on the smoking habits of the population studied.

The data from Chile are not necessarily generalizable to Latin America as a whole, but they support the supposition that smoking is common among young people in some of the more-developed countries and that the quantity smoked is not great. Although the results do not permit the calculation of a single estimate of the prevalence of smoking among young people in Latin America, they do suggest that prevalence varies by level of socioeconomic development and that prevalence may be over 50 percent in some areas.

Additional Prevalence Estimates Reported Since 1980

PAHO has assembled prevalence data, as well as some information on knowledge and attitudes, from country-specific surveys (Tables 16–19). Most of these surveys report a crude prevalence for the population studied, and as noted, the methodologies of these surveys differ substantially.

The overall prevalence of current smoking varies widely in Latin America and the Caribbean—from 6

Table 15. Prevalence of smoking (%) among women aged 15–44, by reproductive history and smoking status, Santiago, Chile, 1988

Smoking status	Never pregnant	Pregnant at least once	No live births	At least one live birth
Current smoker	40.3	43.3	39.6	46.6
Former smoker	22.4	23.3	23.0	21.4
Never smoker	37.3	33.3	37.4	32.0

Source: Valenzuela, Herold, Morris (1989).

percent in rural La Paz, Bolivia, to 49 percent in Pôrto Alegre, Brazil. Prevalence of smoking is higher for men than for women. The distribution of results (Table 20) from the surveys of adults (Table 16)—displayed as a stem-and-leaf plot (Tukey 1977)—reveals that the prevalence for men is centered in the 30 to 49 percent range (median = 37 percent); 74 percent of observations were greater than 30 percent. For women, most results were in the 10 to 29 percent range (median = 20 percent); 24 percent of observations were greater than 30 percent. Most reports of low prevalence for women were from less-developed, predominantly rural areas. A similar rural–urban gradient was also found for men.

In general, crude prevalence was highest in the Andean region, the Southern Cone, and Brazil (Table 16). Prevalence tended to be intermediate in Central America, Mexico, and the Latin Caribbean and lowest in the other Caribbean countries (Table 16). Lifetime prevalence (51 percent) was reported for men in Jamaica. For Trinidad and Tobago, a 42 percent prevalence is given for men in a single urban area. The available information suggests that for male, urban dwellers in the more-developed countries of Latin America and the Caribbean, the prevalence of smoking exceeds 50 percent; for rural women in less-developed countries, the prevalence is less than 10 percent. The data do not permit calculation of a single estimate of the prevalence of smoking in the region, since no unified, planned prevalence survey of the region has been attempted.

Cigarette smoking was also common among physicians. The range for the 11 studies that reported prevalence among medical students, physicians in training (residents or house staff), and physicians was 17 to 49 percent (Table 16).

Prevalence of smoking for adolescents appears to follow a pattern similar to that for adults (Table 17). Prevalence is higher for young men than for young women and higher in urban areas of the more-developed countries. The regional pattern is also similar, except that smoking among young people appears to be more common in the non-Latin Caribbean than in Central America, Mexico, and the Latin Caribbean. The prevalence of smoking for adolescents is high in some areas—perhaps even higher than the prevalence for adults. A prevalence of greater than 30 percent is reported by almost half of the surveys for young men and almost one-third of the surveys for young women.

Surveys of women of childbearing age have been conducted in some Latin American and Caribbean countries (Table 18). The results generally confirm those cited earlier (also included, in part, in Table 18). The prevalence of smoking varies considerably; 25 percent of surveys reported a prevalence over 30 percent, and more than half reported a prevalence greater than 20 percent. Since women of reproductive age span the adolescent and adult years, younger women may disproportionately contribute to the high overall prevalence of smoking in some areas.

The few studies available about public knowledge and attitudes with regard to smoking suggest a high level of awareness of the general health hazards of tobacco use (Table 19). One study in Cuba indicated a high level of public approval for an indoor ban on smoking. In contrast, a survey among physicians in Paraguay showed that only 30 percent agreed with the statement that smoking is undesirable. Information on public awareness of the specific health risks of smoking and on the degree to which smokers perceive a personal risk is not available for Latin America and the Caribbean; data for the United States, however, have been considered in detail (USDHHS 1989). Collection of such information for Latin America and the Caribbean will be important to enhancing tobacco control in those regions (see Chapter 6).

Another aspect of the prevalence of smoking in the Americas is smoking patterns among Hispanic persons who reside in the United States. A large probability survey of Hispanic Americans (Hispanic Health and Nutrition Examination Survey [Hispanic HANES]), conducted in 1982 to 1984, revealed that, for both men and women, the pattern of smoking differs among persons of Mexican origin in the southwest United States, persons of Puerto Rican origin in the New York City area, and persons of Cuban origin in the Miami area. For all three groups, the weighted prevalence of cigarette smoking was higher for men than for women (Table 21). But persons of Puerto Rican or Cuban origin were more likely than persons of Mexican origin to be heavy smokers (Haynes et al. 1990). Compared with the prevalence of smoking for the general U.S. population (USDHHS 1989), the prevalence of smoking was higher for men of all three Hispanic groups and for women of one group (Puerto Rican origin).

The Hispanic HANES survey of 1982 to 1984 also showed that with decreasing income and educational attainment, the prevalence of smoking increases among Hispanic men (Haynes et al. 1990). In addition, for women of Puerto Rican origin residing in the New York City area, the prevalence of cigarette smoking is approximately twice that of women in Puerto Rico (Becerra and Smith 1988).

Approximately five years after the Hispanic HANES survey, the National Health Interview Survey

(NHIS) revealed that the prevalence of smoking for all these groups had declined substantially, parallel with the decline in prevalence in the general U.S. population (Table 21) (Schoenborn1989). Detailed analysis of prevalence of cigarette smoking among successive birth cohorts, however, shows little reduction for women of Mexican origin and an increase for women of Puerto Rican or Cuban origin (Escobedo, Remington, Anda 1989).

Direct comparison with data for populations in the areas of origin is not possible (Table 16) because of differences in sampling methods, but the data suggest that some trends for Hispanic persons residing in the United States may be the same as those for the general U.S. population (Escobedo, Remington, Anda 1989; Escobedo et al. 1990; Harris 1983). Although prevalence of smoking has declined among Hispanic men and women, uptake of smoking is increasing among young Hispanic women. In general, persons of Hispanic origin in the United States reflect a mixture of the cultural forces in Latin America and North America.

Table 16. Prevalence of tobacco use among adults reported by surveys in Latin America and the Caribbean, 1980s and 1990s

Region and Country	Survey					Prevalence* (%)		
	Year	Sample area	Number	Age	Sponsor	Men	Women	Total
Andean Area								
Bolivia	1983	La Paz	945	≥15	Bolivian Cancer Foundation	41/37	32/33	36/35
	1986	Sucre	1,028	≥15	Department of Mental Health	35	18	28/41
	1986	Rural La Paz	1,060	≥15	Department of Mental Health	6	3	6/48
	1986	Urban La Paz	1,058	≥15	Department of Mental Health	46/38	29/33	38/36
	1987	Physicians in La Paz	72		Osorovic and Ríos-Dalenz			35/17
Colombia	1980	Nationwide	6,277	≥15	National Institute of Health	52	26	39
	1985	Medellín (excludes persons of low socioeconomic status)	2,432	≥16	University of Antioquia			30†
	1987	Urban areas	2,400	≥16	Public Health School Drug Survey	43	25	34†
	1988	Nationwide	1,512	18–60+	American Cancer Society/Gallup Organization	37	18	28
Ecuador	1988	Quito, Guayaquil, and three rural capitals	3,657	20–65	Ministry of Public Health, Our Youth Foundation	27/27	11/20	22/24
	1988	Urban areas	1,323	13–60+	American Cancer Society/Gallup Organization	39	16	27
	1990	Quito	1,805	≥10	Ministry of Public Health			23/27
Peru	1980	Households in Lima/Callao	2,167	12–45	Police Force, Antidrug Unit	49/14	23/11	36/13
	1985	Male firearm licensees in Lima	359	18–70	Police Force, Antidrug Unit	36/23		

Source: Pan American Health Organization (1992).
*Given for current daily smokers/occasional smokers, or for the former only.
†Smoked during the previous year.

Table 16. Continued

Region and Country	Survey					Prevalence* (%)		
	Year	Sample area	Number	Age	Sponsor	Men	Women	Total
Peru (contd.)	1987	Lima	1,800	15–50	Peruvian Public Opinion	68	40	
	1988	Urban areas	400	18–35+	American Cancer Society/Gallup Organization	28	17	22
	1989	Towns >2,500 population	6,761	12–50	Information Center, Education for the Prevention of Drug Abuse	42	13	26‡
Venezuela	1984	Nationwide			Ministry of Health			38
	1986	Caracas			Ministry of Health			42
	1988	Urban areas	852	18–64	American Cancer Society/Gallup Organization	32	23	27
	1989	Caracas	400		Ministry of Health			36
Southern Cone								
Argentina	1981	Buenos Aires	306	15–74	Alvarez	39	27	33
	1988	Buenos Aires pediatric hospital staff	128	20–55	Pediatric Hospital	48	49	
	1988	Urban areas	826	18–50+	American Cancer Society/Gallup Organization	43	27	35
Chile	1984	Santiago	1,050	>15	Public Health School	34/10	28/11	30/11
	1985	Twelve cities	2,700	>15	Gallup Chile			31
	1987	Three communities near Santiago	1,800	>15	Catholic University Department of Public Health	35/16	32/11	33/13
Paraguay	1988	Medical students and doctors at Catholic University Medical School	375		Estigarribia	25	24	25
	1989	Less than one-half of all medical students	394	16–36	Martinez	18	14	17
	1989	Physicians nationwide	837	20–80	Chaparro	35	24	32
Uruguay	1984	Montevideo	396	≥18	Prevention Volunteers	49/9	31/14	40/12
	1985	Ministry of Public Health employees	525	≥18	Epidemiology Division, Ministry of Health	45	45	45
	1988	Urban areas	799	18–50+	American Cancer Society/Gallup Organization	44	23	32
	1989	Fourth-year medical students in Montevideo		22–26	Ruocco			24

*Given for current daily smokers/occasional smokers, or for the former only.
‡Smoked during the previous month.

Table 16. Continued

Region and Country	Survey					Prevalence* (%)		
	Year	Sample area	Number	Age	Sponsor	Men	Women	Total
Brazil	1981	Physicians in Pôrto Alegre			Saltz et al.	26	40	
	1982	Medical association				32	27	
	1987	Pôrto Alegre		20–64	Achutti	52	34	49
	1987	São Paulo		15–59	Ramos	45	31	38
	1988	Two state capitals	1,297	18–50+	Gallup Organization	40	36	38
	1988	Twelve state capitals		18–55	Ministry of Health	45	33	39
	1989	Physicians in Rio de Janeiro			Campos	28	23	
Central America[§]								
Costa Rica	1986	Households nationwide	35,000	≥15	Office of Statistics	35	14	30
	1987	Nationwide	2,700	14–60	Alcohol and Drug Dependency Institute	33	11	22
	1988	Nationwide	1,213	18–40+	American Cancer Society/ Gallup Organization	35	20	28
El Salvador	1988	Nationwide, urban	1,300	18–40+	American Cancer Society/ Gallup Organization	38	12	25
Guatemala	1982	Guatemala City	2,403	≥10	Drug Institute	53	30	47
	1987	University of San Carlos students and teachers	170		San Carlos Medical School	34	36	34
	1989	Urban areas	7,372	≥15	Health Department	38	18	27
	1989	Finance Office employees	350		Health Department	48	38	44
Honduras	1987	Ministry of Health employees	293		Ministry of Health			22
	1988	Urban areas	1,200	18–40+	American Cancer Society/ Gallup Organization	36	11	24
Nicaragua	1988	Employed persons	520	≥18	Mount Sinai Medical Center	51	6	41
Panama	1983	Nationwide	1,631	≥18	National Cancer Association	56	20	38
	1986	Health Department employees	11,385		National Cancer Association	10	4	7
	1989	Health Department pensioners	100	≥55	National Cancer Association	48	13	33
Mexico	1983	Physicians	495					33
	1986	Households	14,528	≥12	National Health Survey	27	8	17
	1988	Urban areas	12,581	12–65	Secretary of Health	38	14	26
	1988	National Respiratory Institute employees				41	18	28
	1988	Urban areas	2,600	15–45+	American Cancer Society/ Gallup Organization	37	17	27

*Given for current daily smokers.
[§]Excludes Belize.

Table 16. Continued

Region and Country	Survey					Prevalence* (%)		
	Year	Sample area	Number	Age	Sponsor	Men	Women	Total
Mexico (contd.)	1989	Physicians in Mexico City (telephone)	818		Menese et al.			23
Latin Caribbean[‖]								
Cuba	1984	Nationwide	4,968	≥17	Cuban Institute for Research and Orientation of Internal Demand			42
	1988	Nationwide	5,933	≥14	Cuban Institute for Research and Orientation of Internal Demand	48	26	36
Dominican Republic	1989	Health Department employees	704		Ministry of Health	25	22	20
	1989	Nationwide	502	20–79	Ministry of Health	66	14	40[¶]
	1991	Households in Santo Domingo	1,392	15–55+	Vincent et al.	36	33	35
Puerto Rico	1989	Behaviorial Risk Factor Survey, San Juan (telephone)	772	≥18	School of Public Health	23	11	
Selected Caribbean countries								
Anguilla	1989	Islandwide	101	15–74	Health Department	10/9	2/10	7/9
Bahamas	1988	Areawide	933	≥15	Health Department	20	5	11
Bahamas	1989	Areawide	1,000	16–59	Health Department Drug Survey	19	4	10
Jamaica	1987	Household Council	6,007	≥12	National Council on Drug Abuse	51[**]	15[**]	
	1987	Household	1,000	≥10	Jamaican Medical Association	25	6	
Aruba and Netherlands Antilles	1989	Random sample of population (1%)	623		Ministry of Health	32	13	21
Trinidad and Tobago	1981	St. James (Port of Spain)	2,491	35–69	State government and Medical Research Council (United Kingdom)	42	8	27
U.S. Virgin Islands	1989	Household Behavioral Risk Factor Survey (telephone)	141	≥18	Health Department	15	9	12
	1989	2% population sample after hurricane	727					11

*Given for current daily smokers/occasional smokers, or for the former only.
‖Excludes Haiti.
¶Definition of smoking status unavailable.
**Smoked during lifetime.

Table 17. Prevalence of tobacco use among adolescents reported by surveys in Latin America and the Caribbean, 1980s and 1990s

Region and Country	Survey					Prevalence* (%)		
	Year	Sample area	Number	Age	Sponsor	Men	Women	Total
Andean Area								
Bolivia	1980	La Paz	18,956	14–22	Committee on Drugs			42
	1983	Tarija	120	18	Bolivian Cancer Foundation			63
	1983	La Paz	707	13–18	Bolivian Cancer Foundation	51	43	44
	1986	La Paz	1,359			72	61	
Colombia	1985	Medellín		10–15	Public Health School			30†
	1987	Urban areas	400	12–15		5	4	5†
	1985	Cali, private school	283	16–18	University of Valle drug survey			16†
	1985	Cali, public school	512		University of Valle drug survey			6†
	1989	National school	7,513	11–25	Education Ministry			10/22†
Ecuador	1988	Nationwide	2,599	10–19	Ministry of Public Health	15	15	15†
	1988	Nationwide	329	13–19	American Cancer Society/Gallup Organization			16
Peru	1980	Lima/Callao	419	12–19	Police Force, Antidrug Unit			44
	1982	Public school	1,311	<18	Cancer Institute	41		
		Private school	206	<18	Cancer Institute			64
	1985	University	1,379	15–22	University of Sacred Heart		90	
	1989	Nationwide		12–19	Drug Abuse Center			34
Venezuela	1984	Caracas	225	12–15	Ministry of Health			7‡
Southern Cone§								
Argentina	1981	Buenos Aires		15–21				14
	1986		1,007	12–15	Tobacco Industry			3
Chile	1981	Santiago	330	18–20	Department of Health	69	65	67
	1986	Rural areas	415	18–20	University of Concepción	37	28	34
	1986	Santiago	761	18–20	Department of Health			51
Uruguay	1975	Montevideo	10,496	12–16		33	32	
		Ten high schools		17–18		50	45	
Brazil	1980	Pôrto Alegre		10–19	Rosito et al.			13/15
	1984	Pôrto Alegre		10–19	Rosito et al.			11/11
	1987	Ten state capitals		10–18	Barbosa et al.			16†
				≥18				20‡
	1989	Ten state capitals	42,475	10–18	Corlini et al. (Psychotropic Drug Center)			16†
				≥18				27‡
	1989	Street boys in three cities			Corlini et al.	75‖		
	1989	São Paulo		6–18	Moraes et al.			6/27

Source: Pan American Health Organization (1992).
*Given for current daily smokers/occasional smokers, or for the former only.
†Smoked during the previous year.
‡Ever smoked.
§Excludes Paraguay.
‖Smoked during the previous month.